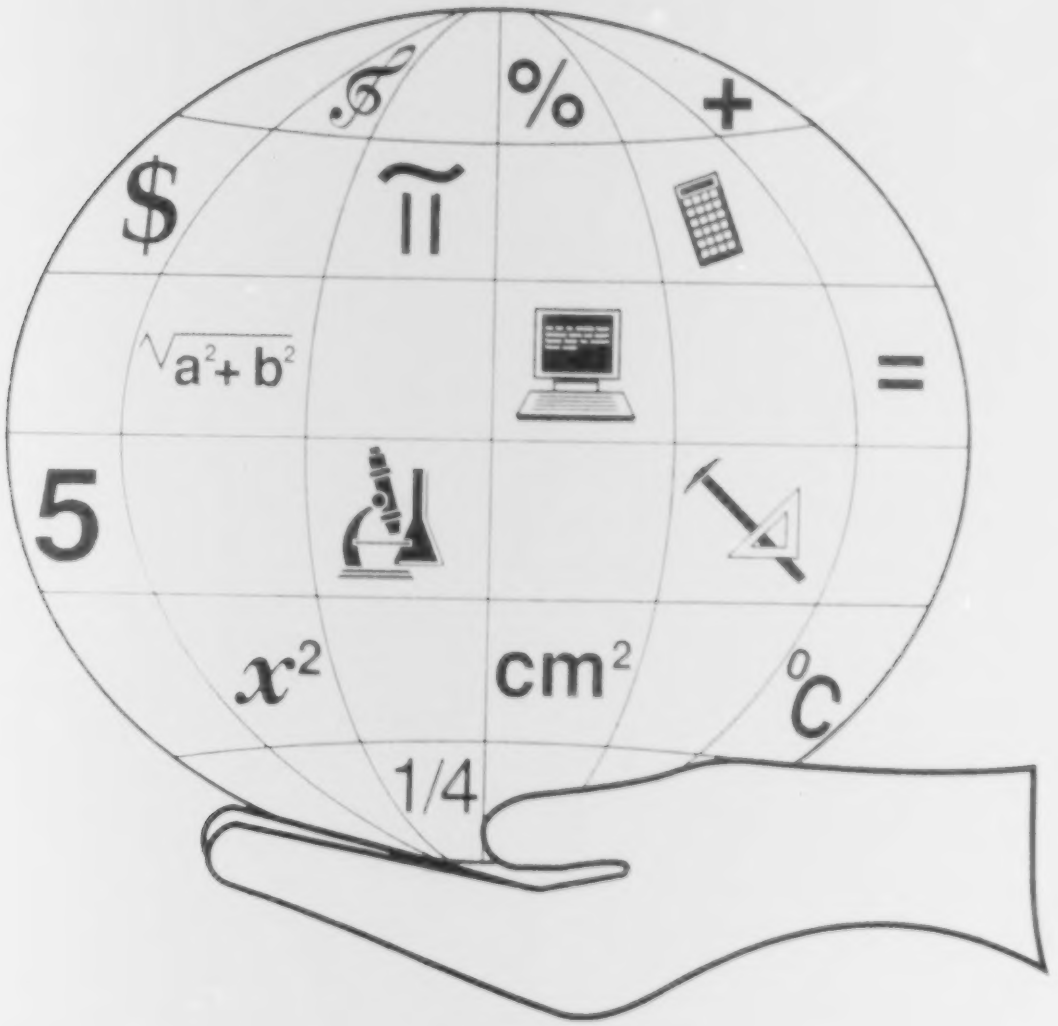
Saskatchewan
Learning

Calculus 30:
A Bibliography



Recycled Paper

2004

Calculus 30:
A Bibliography

Prepared by:
Instructional Resources Unit
Curriculum and Instruction Branch
Saskatchewan Learning
2004

Calculus 30: A bibliography

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Acknowledgements

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Foreword

This bibliography includes a selected listing of learning resources to support the Calculus 30 Curriculum. These learning resources were recently evaluated by Saskatchewan educators.

The Instructional Resources Unit of the Curriculum and Instruction Branch provides support for implementation of Saskatchewan curricula by co-ordinating evaluation of learning resources to support curricula. The learning resources are annotated and include suggested uses.

The materials in this bibliography are offered only as suggestions; teachers are encouraged to preview and select other applicable learning resources.

Saskatchewan Learning has provided one copy of this bibliography to every Secondary Level school in the province. Additional copies are available from Curriculum Distribution Service, formerly known as the Learning Resources Distribution Centre. **Curriculum Distribution Service can be contacted at:**

4635 Wascana Parkway
REGINA SK S4P 3V7
Ph: (306) 787-5987
Fax: (306) 787-9747
E-mail: curriculum.orders@
sasked.gov.sk.ca.

Please note that this document may be photocopied, and is also available on the Saskatchewan Learning website at the following address:

www.sasklearning.gov.sk.ca/branches/curr/iru/onlbib.shtml

Resource-Based Learning

Steps to a Multiresource Approach to Teaching Secondary Level Mathematics

The learning resources in this bibliography support Saskatchewan Learning's philosophy of Resource-based Learning in which the curriculum is supported by a variety of resources rather than a single textbook. This approach provides students with opportunities to interact with a wide range of current media in a variety of learning situations. It is important that human resources be accessed as well because, in every community, there are capable people who can enrich the learning experience.

Background Review: Selection Policy and Criteria for Selection

The learning resources in this bibliography are recommended to support Calculus 30; however, it remains the responsibility of classroom teachers, in consultation with teacher-librarians, to preview and select materials. Selection should be based on the philosophy and objectives of the curriculum, students' prior knowledge and experience, students' interests and abilities, as well as the community context.

Also, material should be considered in terms of the following characteristics:

- literary quality
- cultural relevance and accuracy
- country of origin
- equity regarding gender, age, and race
- accuracy
- ease of reading
- relevance to current issues
- adaptability
- diversity of instructional approaches.

Several Saskatchewan Learning publications available from Curriculum Distribution Service provide further assistance in the selection process. These include the following:

Diverse Voices: Selecting Equitable Resources for Indian and Métis Education, 1995 – suggests strategies for recognizing and dealing with bias in learning resources. (Order no. 1901)

Learning Resource Centres in Saskatchewan: A Guide for Development, 1988 – provides guidance for developing a selection policy and suggests criteria for selection. (Order no. 5239)

Multicultural and Heritage Language Education Policies, 1994 – provides rationale for integrating multicultural materials into curricula. (Order no. 1219)

Selecting Fair and Equitable Materials, 1991 – suggests strategies useful for recognition of bias and stereotypes. (Order no. 751)

Assessing Present Learning Resources

The learning resources listed should be cross-referenced with the school resource centre catalogue in order to identify suitable learning resources already present in the school library collection.

Materials in the present collection should be assessed based on the needs of the curriculum, the students, and the teachers. Considerations of needs include reflection of curriculum philosophy; accuracy, currency, readability; relevance, adaptability, and versatility of resources. Ideally, each classroom would have a collection of basic, frequently used manipulatives.

Previewing Learning Resources

Teachers and teacher-librarians are urged to preview learning resources carefully before suggesting them for classroom use, and they are advised to refer to their school division's selection policy for guidance in making choices about learning resources.

If schools have not been able to preview the learning resources prior to purchase, it is advisable to order only one copy to review before placing orders for multiple copies. Return policies vary from company to company, but if inappropriate learning resources have to be returned, they must be in saleable condition. A copy of the packing slip or invoice must be included with the returned materials.

Purchasing Learning Resources

Schools interested in purchasing learning resources may order them from the distributors cited in the distributor directory.

Prices quoted are subject to change, but will serve as a guide to approximate costs. Prices quoted do not include taxes or shipping fees.

Please note that while the learning resources listed in this bibliography were available at the time of printing, publishers/producers can withdraw them unexpectedly at any time.

Information Regarding Particular Categories of Learning Resources

Textbooks

If class sets of textbooks have been purchased recently, they may be used as one of many resources. Textbook materials considered suitable are listed in this bibliography; however, all textbooks must be examined carefully. Only those parts that support the objectives of the curriculum and the recommended instructional and evaluation practices should be used. A class set of textbooks is expensive and can quickly become outdated.

Graphing Calculators

It is strongly recommended that graphing calculators be used in the Calculus 30 classroom. The efficient use of this tool will allow students to explore many concepts in greater depth, to develop a broader understanding of related families of equations or data, and to become more proficient in applying this knowledge to real-world situations.

Online Databases of Periodicals and Newspapers: Infotrac, Canadian Newsstand Dailies, and CBCA/Repère

Saskatchewan Learning offers a number of online databases for periodicals and newspapers. Online databases are a powerful tool to assist teachers with the integration of technology into teaching and learning. The databases provide teachers and students with access to **both current and archived** information on any given topic/subject area.

Canadian content is featured in Micromedia's ***Canadian Business and Current Affairs (CBCA/Repère-French)***, Infotrac's ***Canadian Periodical Index Quarterly (CPI.Q)***, and Proquest's ***Canadian Newsstand Dailies***. The databases are located at the following address:

www.sasklearning.gov.sk.ca/branches/curr/evergreen/databases.shtml

To access the online databases, educators need to click on their region and enter the appropriate password. If they need the password, they should contact the teacher-librarian, local Resource-based Learning Consultant or Saskatchewan Learning at (306) 787-1194.

Manipulatives

Calculus 30: A Curriculum Guide for the Secondary Level promotes the active participation of all students. Students learn best by forming mental pictures of numbers, number relations, and mathematical concepts through manipulation of concrete material. Therefore, every calculus teacher should have basic manipulative materials as part of the classroom learning resource collection. Some manipulatives should be purchased; others can be constructed or collected. Most concrete materials can be used in a wide variety of ways in the classroom.

It is recommended that manipulatives be obtained based on the needs of the students, the teacher, and the curriculum. The use of manipulatives is highly recommended for teaching mathematics at all grade levels. It is recommended that teachers initially focus on the multiple applications of a few major manipulatives and gradually expand the scope of manipulatives used. It is also recommended that less frequently used items be shared among teachers in the school.

When obtaining manipulatives, it is advisable to purchase sufficient quantities of highly useful manipulatives rather than a commercially prepared kit that may contain items less frequently used. Print material to support various manipulatives is available and its use is recommended.

Internet Sites

Saskatchewan Learning is providing a forum through the Evergreen Curriculum Resources page for teachers to access and share educationally appropriate Internet sites. The gateway to the URL Database of websites can be found at the following addresses:

www.sasklearning.gov.sk.ca/branches/curr/evergreen/resources_main.shtml **or** directly through www.sasklearning.gov.sk.ca/pls/urldb/udb_pkg.main

Information on sites that are highly recommended and linked to curriculum objectives can be found by accessing this database.

Teachers are encouraged to share their favourite Internet sites with others in the province by registering in the URL database. Once an account has been created, teachers will be able to suggest new Internet sites as well as access and review sites submitted by other teachers. The reviews are used to decide upon a recommendation and links to the curriculum. Registration can be done via the addresses above.

The Virtual Resource Centre (VRC) will provide access to general Internet sites that relate to the curriculum. The VRC can be found at the following address:

www.sasklearning.gov.sk.ca/branches/curr/evergreen/vrc/index.html

If teachers are unsure about the reliability of the information found on a website, they should compare the author's claims and evidence with other sources with which they are familiar. When in doubt, teachers should choose only the sites that list the authors' and/or contributors' names along with the title. If the site does not identify contributors and authors, the information found on the site may not be reliable.

The Internet sites listed below provide a sample of what is available. It is recommended that a careful screening and evaluation of each site be undertaken prior to using it. These sites were checked for availability on July 28, 2004.

The Math Forum

http://mathforum.org/

This website offers a good variety of mathematical resources. *The Math Forum* includes such topics such as Algebra, Cabri, MathMagic, Problem of the Week, Project of the Month, Reference Materials, Sketchpad, Mathematics-related Software, and Tests to name a few. One of the most interesting elements of *The Math Forum* is "Ask Dr. Math." This component of *The Math Forum* allows teachers and students to ask questions about any mathematical topic. The site is divided into four levels: elementary school, middle school, high school, and college and beyond. At each of the levels, several topics are presented. For Calculus 30, teachers or students can access the following bins: "Algebra," "Analysis," "Calculus," "Complex Numbers," "Equations and Graphs," "Fractals," "Geometry," "Golden Ratio," "Graphics Calculator," "Interest Problems," "Linear Algebra," "Linear Equations," "Logarithms," "Mathematics History," "Negative Numbers," "Permutations," "Polynomials," "Probability," "Puzzles," "Series," "Square Roots," "Statistics," "Symmetry," "Transcendentals," and "Trigonometry."

Math Central

http://MathCentral.uregina.ca

Math Central was developed at the University of Regina by the Faculty of Mathematics and Statistics in collaboration with the Faculty of Education. The purpose of the site is to assist teachers, interns, and students in teaching mathematics in accordance with the province's mathematics curricula.

The site is divided into three sections:

- "Queries and Quandaries" allows users to share on the Internet their questions and problems.
- "Resource Room" serves as a collection hub for model units, lessons, activities, and/or ideas developed by mathematics teachers.
- "Teacher Talk" targets the teacher and student-teacher and encourages them to share questions, answers, and ideas via e-mail.

National Library of Virtual Manipulatives for Interactive Mathematics

http://matti.usu.edu/nlvm/nav/

This website is a library of unique interactive, web-based virtual manipulatives. The library contains four grade-level groupings separated into strands. These java applets are useful mathematics instructional tools for developing calculus concepts.

Virus Alert

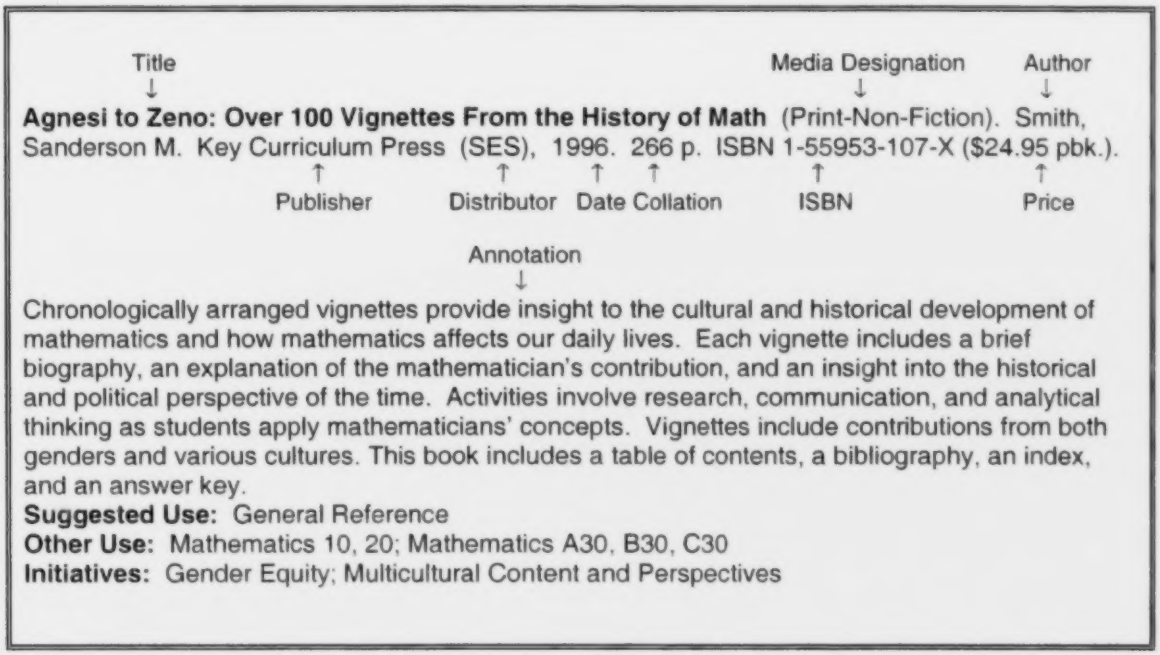
Virus Alert

When downloading files and applications, Internet users should be aware of the danger of viruses. Downloaded files and applications should always be scanned using a current anti-virus utility. It is advisable to purchase updates to the anti-virus utility regularly. These updates identify the new viruses as well as the old.

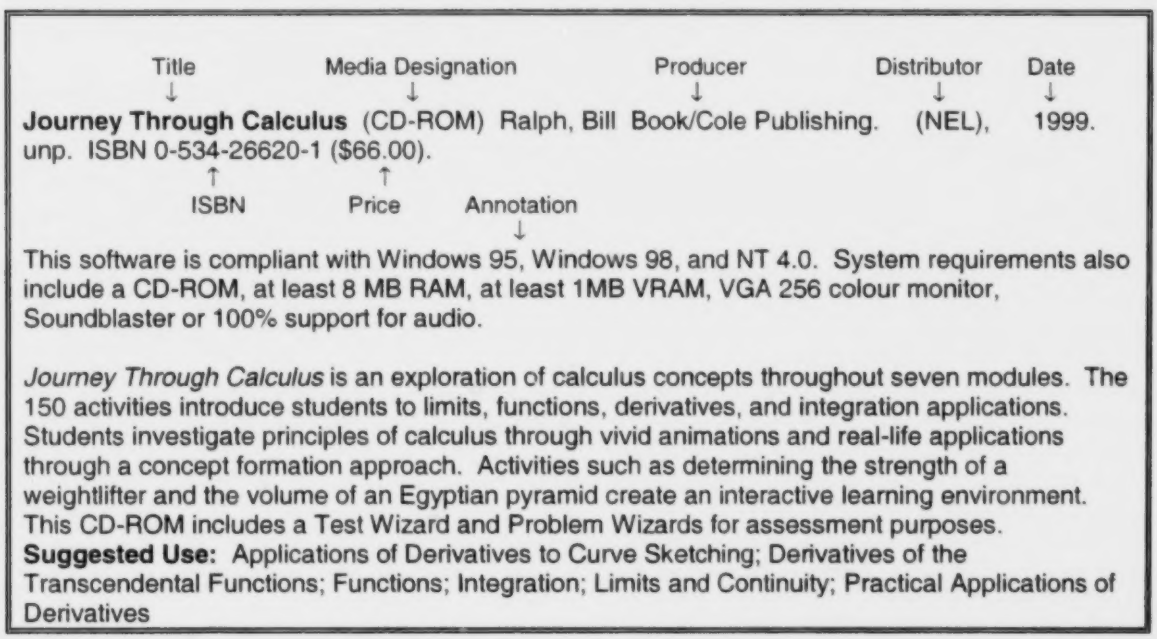
How to Use the Bibliography

Titles and Descriptions

The entries provide bibliographic information, sources, annotations, suggested uses, as well as initiatives and other uses if applicable. An example of a print entry follows:


Title
Media Designation
Author
Agnesi to Zeno: Over 100 Vignettes From the History of Math (Print-Non-Fiction). Smith, Sanderson M. Key Curriculum Press (SES), 1996. 266 p. ISBN 1-55953-107-X ($24.95 pbk.).
Publisher
Distributor
Date
Collation
ISBN
Price
Annotation
Chronologically arranged vignettes provide insight to the cultural and historical development of mathematics and how mathematics affects our daily lives. Each vignette includes a brief biography, an explanation of the mathematician's contribution, and an insight into the historical and political perspective of the time. Activities involve research, communication, and analytical thinking as students apply mathematicians' concepts. Vignettes include contributions from both genders and various cultures. This book includes a table of contents, a bibliography, an index, and an answer key.
Suggested Use: General Reference
Other Use: Mathematics 10, 20; Mathematics A30, B30, C30
Initiatives: Gender Equity; Multicultural Content and Perspectives

An example of a CD-ROM entry follows:


Title
Media Designation
Producer
Distributor
Date
Journey Through Calculus (CD-ROM) Ralph, Bill Book/Cole Publishing. (NEL), 1999. unp. ISBN 0-534-26620-1 ($66.00).
ISBN
Price
Annotation
This software is compliant with Windows 95, Windows 98, and NT 4.0. System requirements also include a CD-ROM, at least 8 MB RAM, at least 1MB VRAM, VGA 256 colour monitor, Soundblaster or 100% support for audio.
Journey Through Calculus is an exploration of calculus concepts throughout seven modules. The 150 activities introduce students to limits, functions, derivatives, and integration applications. Students investigate principles of calculus through vivid animations and real-life applications through a concept formation approach. Activities such as determining the strength of a weightlifter and the volume of an Egyptian pyramid create an interactive learning environment. This CD-ROM includes a Test Wizard and Problem Wizards for assessment purposes.
Suggested Use: Applications of Derivatives to Curve Sketching; Derivatives of the Transcendental Functions; Functions; Integration; Limits and Continuity; Practical Applications of Derivatives

The abbreviation **hdc.** denotes hardcover edition; **pbk.** denotes paperback edition.

ISBN denotes the International Standard Book Number, usually the order number.

WNCP indicates that the material was selected for mathematics through the Western and Northern Canadian Protocol for Collaboration in Basic Education.

Suggested Use provides suggestions for the units that the resource best supports.

Other Use indicates the other subject area(s) and level(s) that the resource **has previously been recommended** for in Saskatchewan Learning bibliographies.

Initiative(s) indicates the Saskatchewan Learning initiative(s) that the resource supports. The initiatives include Abilities Awareness, Aboriginal Content and Perspectives, Career Development, Gender Equity, and Multicultural Content and Perspectives.

Index of Suggested Uses

Titles are listed alphabetically under each unit of study.

Media Index

Titles are listed alphabetically under each media designation.

Distributor Directory

The abbreviations enclosed in parentheses following the publisher or producer represent the distributor. The full names, addresses (including e-mail and websites where available), fax and phone numbers of these companies are given in this section. Please note that some distributors provide a toll-free phone number.

Titles and Descriptions

Titles and Descriptions

Agnesi to Zeno: Over 100 Vignettes From the History of Math (Print-Non-Fiction). Smith, Sanderson M. Key Curriculum Press (SES), 1996. 266 p. ISBN 1-55953-107-X ($39.95 pbk.).

Chronologically arranged vignettes provide insight into the cultural and historical development of mathematics and how mathematics affects our daily lives. Each vignette includes a brief biography, an explanation of the mathematician's contribution, and an insight into the historical and political perspective of the time. Activities involve research, communication, and analytical thinking as students apply mathematicians' concepts. Vignettes include contributions from both genders and various cultures. This book includes a table of contents, a bibliography, an index, and an answer key.
Suggested Use: General Reference
Other Use: Mathematics 10, 20; Mathematics A30, B30, C30
Initiatives: Gender Equity; Multicultural Content and Perspectives

Applied Calculus With Microsoft Excel (Print-Non-Fiction). Piascik, Chester. Brooks/Cole Publishing (NEL), 2000. 168 p. ISBN 0-534-37058-6 ($28.00 pbk.).

This learning resource integrates Excel spreadsheet exercises to teach calculus concepts. Chapters are designed to emphasize developmental meaning and understanding of mathematical concepts such as graphing functions, graphical analysis, and the dynamics of change. Each section begins with a subject matter exposition followed by exercises. Exercises include students verbalizing and verifying the mathematical concepts behind spreadsheet results. This resource includes a table of contents and an answer key.
Suggested Use: Differentiation; Functions; Limits and Continuity; Practical Applications of Derivatives

Calculus and Its Applications. 8th ed. (Print-Non-Fiction). Bittinger, Marvin L. Addison-Wesley Longman, Inc. (PRN), 2000. 566 p. ISBN 0-321-16639-6 ($79.16 hdc.).

The eighth edition of *Calculus and Its Applications* provides students with many authentic applications and data. Applications integrate with other disciplines to show students the relevance of calculus. Chapter topics include differentiation, exponential functions, logarithmic functions, integration, and functions of several variables. Opportunities to incorporate technology are suggested throughout the resource. Algebraic skills are reviewed in the appendix. This learning resource contains numerous visuals to bolster calculus skills. The resource includes a table of contents, a table of formulas, and an answer key.

Also note that this resource contains Imperial measurements, but this is not a limiting factor. The problems and applications are the strength of this resource.
Suggested Use: Additional Topics; Applications of Derivitives to Curve Sketching; Derivatives of the Transcendental Functions; Differentiation; Functions; The Fundamental Theorem of Calculus; Integration; Introduction; Limits of Continuity; Practical Applications of Derivatives

Calculus for Cats (Print-Non-Fiction). Amdahl, Kenn and Loats, Jim. Clearwater Publishing Company, Inc. (CWG), 2001. 179 p. ISBN 0-9627815-5-X ($14.95 U.S. pbk.).

This humourous and witty book applies the concepts and vocabulary of calculus to the exploits of felines. The authors theorize that calculus was invented by cats who have a vested interest in keeping human beings from gaining a conceptual understanding of the discipline. As long as human beings do not understand calculus, cats can continue to rule the world. The fundamentals of calculus are explained through analogies rather than mathematical exercises. The book includes a table of contents.
Suggested Use: Derivatives of the Transcendental Functions; Differentiation; Functions; Integration; Limits and Continuity; Practical Applications of Derivatives

Calculus: The Easy Way. 3rd ed. (Print-Non-Fiction). Downing, Douglas D. (The Easy Way Series). Barron's Educational Series (BAR), 1996. 324 p. ISBN 0-8120-9141-8 ($19.50 pbk.).

This unique resource explains calculus concepts through the fantastical adventures of medieval characters in the land of Carmonna. The royal subjects apply calculus concepts to solve arising problems in the kingdom. Following each adventure, the chapters outline exercises for students to apply the developed concepts. The exercises include traditional practice, computer programming examples, and authentic applications of calculus, such as finding the motion of a planet around the sun. Included are a table of contents, a glossary, an index, an appendix of answers to the exercises, an appendix of trigonometric formulas, and a table of integrals. This wryly humourous resource provides a context for calculus applications.
Suggested Use: Additional Topics; Applications of Derivitives to Curve Sketching; Derivatives of the Transcendental Functions; Differentiation; Functions; The Fundamental Theorem of Calculus; Integration; Introduction; Limits of Continuity; Practical Applications of Derivatives

Discoveries Series (Print-Non-Fiction). Please refer to the title: *Numbers: The Universal Language.*

The Easy Way Series (Print-Non-Fiction). Please refer to the title: *Calculus: The Easy Way.*

Exploring Calculus With the Geometer's Sketchpad (Print-Non-Fiction). Clements, Cindy, Pantozzi, Ralph, & Steketee, Scott. Key Curriculum Press (SES), 2002. 174 p. ISBN 1-55953-535-0 ($62.95 pbk.).

Exploring Calculus With the Geometer's Sketchpad is comprised of 32 blackline masters to accompany *The Geometer's Sketchpad.* Interactive activities include exploring limits, derivatives, antiderivatives and integrals. Each activity includes a set of reproducible instructions for using tools or constructing objects and sidebar tips to provide extra assistance. The book includes a table of contents. Activity notes, which appear at the end of the book, include answers, explanations of how sketches were constructed, and possible extension ideas.

The resource includes a CD-ROM that contains sketches to accompany each activity, demonstration sketches, and tools to create sketches.

Please note that *The Geometer's Sketchpad* has to be purchased separately (see the following annotation).
Suggested Use: Applications of Derivatives to Curve Sketching; Differentiation; Fundamental Theorem of Calculus; Limits and Continuity

The Geometer's Sketchpad: Dynamic Geometry Software for Exploring Mathematics (Kit). Key Curriculum Press (SES), 2001. Macintosh/Windows - Single user - Order no. 203820 ($179.95). Macintosh/Windows - 10 user lab pack - Order no. 203822 ($599.95).

System Requirements:

- Pentium-based system or equivalent
- Windows 95 or NT 4.0 or later including XP)
- 16 MB RAM
- CD-ROM drive

- any Macintosh Power PC-based system
- Mac OS 8.6 or later
- 16 MB RAM
- CD-ROM drive

This resource kit consists of discs, a user guide and reference manual, teaching notes and sample activities, a quick reference, and an introductory video. It models geometry in two linked views: sketches and scripts. Sketches depict concrete geometry and emphasize spatial reasoning, while scripts describe constructions verbally and abstractly. The program allows for the construction, labelling, measurement, and manipulation of any geometric figure and the exploration of geometry concepts.

Please note that the system defaults to inches, but it can be set to centimetres. Also, the demonstration version allows users to produce sketches, but these sketches cannot be saved, printed, or exported to another document.

The user guide and reference manual assist in learning to use the program.

The teaching notes and sample activities provide suggestions for classroom use. Several sample investigations, explorations, demonstration and construction activities on a wide range of geometry topics are included.

Please see the previous annotation for information on *Exploring Calculus With the Geometer's Sketchpad*, a resource that is available separately to accompany *The Geometer's Sketchpad*.
Suggested Use: Applications of Derivatives to Curve Sketching; Differentiation; Fundamental Theorem of Calculus; Limits and Continuity

Green Globs & Graphing Equations (CD-ROM). Dugdale, Sharon and Kibbey, David. Sunburst Communications (EDRS), 1997. School Version - Order no. T04348 ($155.97). Lab pack of 10 - Order no. T04350 ($155.97). Network - Order no. T04353 ($909.97).

System Requirements:

- Macintosh System 6.0.5 or higher (System 7 recommended), 1 MB RAM.
- Windows 3.1, 486/25 MHz or better, 2 MB RAM; 256 colour monitor.
- Windows 95: 486DX/50 MHz or higher (Pentium recommended), 4 MB RAM, 256 colour monitor

(WNCP) This resource has two components: a basic graphing utility and an interactive series of games. The graphing utility allows the user to graph linear, quadratic, polynomial, rational, absolute value, and trigonometric relations. The games require students to relate points on the graph and the equations of functions and/or relations. At its highest level, students must first probe using equations of vertical and horizontal lines to determine the location of points, and then they must determine the exact equations that they represent. This tool provides a hands-on experience for the students when learning the connections between relations and the resulting graphs.

A teacher's guide accompanies the disc and provides ideas and worksheets.
Suggested Use: Functions
Other Use: Mathematics 10, 20; Mathematics A30, B30, C30

Introducing Mathematics (Print-Non-Fiction). Sardar, Ziauddin, Ravetz, Jerry and Van Loon, Borin. Totem Books (CDS), 1999. 176 p. ISBN 1-84046-011-3 ($15.99 pbk.).

This learning resource traces the history of mathematics in a comic-strip format. Discoveries and concepts from mathematicians of the ancient world to modern times are described. Mathematical topics such as geometry, calculus, number systems, and statistical reasoning are also explored. This book is a humourous look at how mathematical progress has created further unanswered questions. The resource includes an index and a list of suggested literature.
Suggested Use: General Reference
Other Use: Mathematics 10, 20; Mathematics A30, B30, C30

Journey Through Calculus (CD-ROM). Ralph, Bill. Brooks/Cole Publishing (NEL), 1999. ISBN 0-534-26220-1 ($86.50).

System Requirements:

- Windows 95, Windows 98, and NT 4.0
- CD-Rom; 8 MB RAM; 1MB VRAM; VGA 256 colour monitor
- Soundblaster or 100% support for audio

Journey Through Calculus is an exploration of calculus concepts throughout seven modules. The 150 activities introduce students to limits, functions, derivatives, and integration applications. Students investigate principles of calculus via vivid animations and real-life applications through a concept formation approach. Activities such as determining the strength of a weightlifter and the volume of an Egyptian pyramid create an interactive learning

environment. The CD-ROM includes a Test Wizard and Problem Wizards for assessment purposes.
Suggested Use: Applications of Derivatives to Curve Sketching; Derivatives of the Transcendental Functions; Functions; Integration; Limits and Continuity; Practical Applications of Derivatives

The Mathematics of Oz: Mental Gymnastics From Beyond the Edge (Print-Non-Fiction). Pickover, Clifford A. Cambridge University Press (LBR), 2002. 351 p. ISBN 0-521-01678-9 ($40.95 hdc.).

Dorothy is again uprooted from her home! In *Mathematics of Oz: Mental Gymnastics From Beyond the Edge*, she must solve an array of brainteasers in order to escape the clutches of her abductors, a group of mathematically obsessed aliens. Each short chapter is a mathematical adventure in which Dorothy is presented with a mystery, a puzzle, or a problem to solve. The author rates the problems in terms of difficulty. One does not have to complete all the chapters or complete the chapters sequentially. Quotes from *The Wizard of Oz* and cartoon diagrams create a fun-filled mathematical journey through geometry, probability, and number theory. The book includes a table of contents, an index, and a bibliography.
Suggested Use: General Reference
Other Use: Mathematics 10, 20; Mathematics A30, B30, C30

McGraw-Hill Ryerson Calculus & Advanced Functions (Print-Non-Fiction). Dearling, Chris, et al. McGraw-Hill Ryerson Limited (MHR), 2002. 672 p. ISBN 0-07-091709-4 ($90.74 hdc.). Teacher's Resource - ISBN 0-07-091709-4 ($110.20 loose-leaf).

The student resource introduces the construction, interpretation, and analysis of functions through a variety of contexts. Throughout the resource, students explore functions to form a basis of differential calculus in authentic contexts. Each chapter begins with the expected learning outcomes, a review of concepts, and a set of problems. An "Apply, Solve, Communicate" section provides an opportunity for students to apply and communicate their learning. Each chapter section culminates with a "Communicate Your Understanding" in which students represent their conceptual understanding. Sections entitled "Historical Bite" and "Career Connection" are interspersed throughout the resource to highlight the role of mathematics in society. A glossary of terms, answers to exercise questions, an index, and appendices of prerequisite skills and suggestions for using a graphing calculator complete this resource.

A teacher's resource that provides teaching suggestions and an overview of the student text is available to supplement the student text.

A teacher's resource in CD-ROM format is also available. The software is a digital version of the teacher's resource appended with suggested assessment strategies.
Suggested Use: Applications of Derivatives to Curve Sketching; Derivatives of the Transcendental Functions; Differentiation; Functions; Introduction; Limits and Continuity; Practical Applications of Derivatives

Numbers: The Universal Language (Print-Non-Fiction). Guedj, Denis. (Discoveries Series). Abrams, Harry N., Inc. (GBW), 1997. 175 p. ISBN 0-8109-2845-0 ($18.95 pbk.).

Using illustrations and sidebar notes, this learning resource details the history of numbers. The development of the number system, the invention of zero, and the concepts relating to algebra and calculus are described. The illustrations are a stunning collection of photographs, paintings, and historical documents. *Numbers: The Universal Language* provides an interesting look at the cultural history of the number system and how this system affects our daily lives. The book includes an index, a chronology, a glossary, and suggestions for further reading.
Suggested Use: General Reference
Other Use: Mathematics 10, 20; Mathematics A30, B30, C30
Initiative: Multicultural Content and Perspectives

A Tour of the Calculus (Print-Non-Fiction). Berlinski, David. Vintage Books (RAN), 1995. 331 p. ISBN 0-679-74788-5 ($22.95 pbk.).

Berlinski argues that mathematics is as much art as science and applies this belief to the formation of his book. "The Calculus" is explained, not solely in terms of mathematical formulas, but through authentic applications and historical anecdotes. Written in a conversational format, the author presents a method for understanding the applications of calculus in the real world. Included are a table of contents and an index.
Suggested Use: General Reference

Visualizing Calculus (Print-Non-Fiction). Hopper, Clarence. Seymour, Dale, Pubns. (PRN), 1998. 80 p. ISBN 1-57232-442-2 ($26.95 pbk.).

Designed to explore the various functions in calculus using graphic calculators, this learning resource contains programs for Texas Instruments TI-81, TI-82, TI-83, TI-85 Plus, and Casio fx-7700GE, fx-9700GE, and CFX-9800G. Many activities involve an investigation and analysis of the produced data. Some activities are simply a manipulation of the calculator, rather than a development and acquisition of mathematical concepts and relationships. The book includes a table of contents.
Suggested Use: Applications of Derivatives to Curve Sketching; Differentiation; Functions

A Watched Cup Never Cools: Lab Activities for Calculus and Precalculus (Print-Non-Fiction). Kamischke, Ellen. Key Curriculum Press (SES), 1999. 104 p. ISBN 1-55953-318-8 ($28.95 pbk.).

This learning resource involves 19 investigations of calculus concepts through lab activities and writing assignments. Lively, open-ended experiments include determining the rate of change of a Tootsie Roll Pop as it is being consumed, constructing a parabolic dish solar cooker, and watching a cup of coffee cool. Each lab activity includes a student's page and notes for the teacher. Many of the activities are designed as a co-operative learning approach. Students reflect on their learning using the self-assessment forms, reflection forms, and group evaluation forms that are provided. A scope-and-sequence chart and an equipment list are also included. This book has a table of contents and a sample lab activity report.
Suggested Use: Differentiation; Functions; Integration; Limits and Continuity; Practical Applications of Derivatives

Who Is Fourier?: A Mathematical Adventure (Print-Non-Fiction). Transnational College of LEX. Language Research Foundation (LBR), 1995. 435 p. ISBN 0-9643504-0-8 ($34.95 pbk.).

Originally the idea for this learning resource was conceived as a means of relating the mathematical insights of university students to their colleagues. Students, who each explored a different aspect of Fourier, write detailed explanations of their discoveries in each chapter. Mathematical concepts in trigonometry, exponentiation, differentiation, and integration are explored through real-life examples. The authors then use these examples to illustrate a direct application of these areas of mathematics to complex Fourier analysis. Although this book was written at a rudimentary level, it provides an engaging insight into the development of mathematical understanding through the eyes of students. The book includes a table of contents, an index, and a bibliography.
Suggested Use: Differentiation; Functions; Fundamental Theorem of Calculus; Integration
Other Use: Mathematics A30, B30, C30

Workshop Precalculus: Discovery With Graphing Calculators. Preliminary ed. (Print-Non-Fiction). Hastings, Nancy Baxter. Key College Publishing (SES), 2002. 518 p. ISBN 1-930190-11-5 ($58.95 pbk.).

This innovative learning resource presents a constructive approach to teaching calculus. Students gain an understanding of the relationships between functions, data analysis, modelling, and problem solving as they engage in collaborative investigations and discussions. Rather than using lectures, the resource guides

instructors through an interactive teaching format of guiding discussions, posing open-ended questions, introducing concepts, and facilitating collaborative activities. This resource presents an active inquiry approach to learning mathematical concepts. Included are a table of contents, an appendix of information on the use of the TI-83 graphing calculator, and an index.
Suggested Use: Functions
Other Use: Mathematics B30, C30

Index of Suggested Uses

Index of Suggested Uses

Please note that the titles in this list are truncated. The complete titles appear in the citations for each resource.

Additional Topics

Calculus and Its Applications
Calculus: The Easy Way

Applications of Derivatives to Curve Sketching

Calculus and Its Applications
Calculus: The Easy Way
Exploring Calculus With the Geometer's
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Derivatives of the Transcendental Functions

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Calculus: The Easy Way
Exploring Calculus With the Geometer's
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Visualizing Calculus
A Watched Cup Never Cools: Lab
Who Is Fourier?: A Mathematical

Functions

Applied Calculus With Microsoft Excel
Calculus and Its Applications
Calculus for Cats
Calculus: The Easy Way
Green Globs & Graphing Equations
Journey Through Calculus
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Visualizing Calculus
A Watched Cup Never Cools: Lab
Who Is Fourier?: A Mathematical
Workshop Precalculus: Discovery With

Fundamental Theorem of Calculus

Calculus and Its Applications
Calculus: The Easy Way
Exploring Calculus With the Geometer's
Who Is Fourier?: A Mathematical

General Reference

Agnesi to Zeno: Over 100 Vignettes from
Introducing Mathematics
The Mathematics of Oz: Mental
Numbers: The Universal Language
A Tour of the Calculus

Integration

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Calculus for Cats
Calculus: The Easy Way
Journey Through Calculus
A Watched Cup Never Cools: Lab
Who Is Fourier?: A Mathematical

Introduction

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Limits and Continuity

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Calculus: The Easy Way
Exploring Calculus With the Geometer's
Journey Through Calculus
McGraw-Hill Ryerson Calculus &
A Watched Cup Never Cools: Lab

Practical Applications of Derivatives

Applied Calculus With Microsoft Excel
Calculus and Its Applications
Calculus for Cats
Calculus: The Easy Way
Journey Through Calculus
McGraw-Hill Ryerson Calculus &
A Watched Cup Never Cools: Lab

Media Index

Media Index

Please note that the titles in this list are truncated. The complete titles appear in the citations for each resource.

CD-ROM

Green Globs & Graphing Equations
Journey Through Calculus

Kit

Geometer's Sketchpad

Print-Non-Fiction

Agnesi to Zeno: Over 100 Vignettes From
Applied Calculus With Microsoft Excel
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